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Direct Penetrating Radiation Monitoring at the Waste Isolation Pilot Plant Conducted by NMED/DOE OB for the CY 2012 Q-1

The New Mexico Environment Department (NMED) DOE Oversight Bureau has compiled and assessed direct penetrating radiation (DPR) data for CY 2011 Q-1. The accompanying table shows dose levels received from ionizing radiation along the Exclusive Use Area fence-line at the Waste Isolation Pilot Plant and at other locations in the WIPP region. The data were obtained using the E-PERM[®] electret ionization chamber system from Rad Elec Inc. The chambers are housed in aluminum canisters designed to block gamma radiation from radon. The quarterly dose rates have been normalized to reflect an actual quarter of 91.25 days.

Results

DPR results ranged from a minimum average quarterly dose of 18.5 mrad at WIPP Loading Dock WHB (West), to a maximum average quarterly dose of 28.3 mrad at Loving Weigh Station.

Table 1 shows the individual results from each electret and the normalized average quarterly dose in mrad at each location.

Graph 1 shows the average dose calculations from monitors located in the WIPP Exclusive Use Area by quarter.

Conclusion

These calculated doses from DPR are comparable with past results obtained by the Bureau and do not show a trend of increased gamma radiation exposure at the WIPP.

Response

Questions and/or comments may be addressed to Julia Marple by phone at (575) 885-9023 or by email at julia.marple@state.nm.us

- Enclosures:
1. Table 1: Direct Penetrating Radiation Quarterly Dose Rates CY 2012 Q-1
 2. Graph 1: Average Quarterly Dose in the WIPP Exclusive Use Area by Quarter
 3. Map 1: Location of DPR Monitors Maintained by the Bureau

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Julia Marple, Environmental Scientist, DOE OB/WOS

Table 1: Direct Penetrating Radiation Quarterly Dose Rates for CY 2012 Q-1**WIPP 1 WIPP Parking Lot Entrance**

Electret ID	Start Date and Time	Finish Date and Time	# of Days:	Voltage Drop	Quarterly Dose Normalized
SFB 973	1/4/12 1:23 PM	3/29/12 6:23 AM	84.71	39	25.2
SFC 139	1/4/12 1:23 PM	3/29/12 6:23 AM	84.71	40	23.9
SFC 207	1/4/12 1:23 PM	3/29/12 6:23 AM	84.71	44	26.8
Average Quarterly Dose in mRad:					25.3

WIPP 2 WIPP Railroad Track Entrance

Electret ID	Start Date and Time	Finish Date and Time	# of Days:	Voltage Drop	Quarterly Dose Normalized
SFC 057	1/4/12 1:17 PM	3/29/12 6:18 AM	84.71	36	22.1
SFC 065	1/4/12 1:17 PM	3/29/12 6:18 AM	84.71	39	23.9
SFC 082	1/4/12 1:17 PM	3/29/12 6:18 AM	84.71	35	21.6
Average Quarterly Dose in mRad:					22.6

WIPP 3 WIPP Southwest Corner Fence

Electret ID	Start Date and Time	Finish Date and Time	# of Days:	Voltage Drop	Quarterly Dose Normalized
SFB 974	1/4/12 1:30 PM	3/29/12 5:59 AM	84.69	35	22.3
SFB 983	1/4/12 1:30 PM	3/29/12 5:59 AM	84.69	38	23.9
SFC 025	1/4/12 1:30 PM	3/29/12 5:59 AM	84.69	37	23.2
Average Quarterly Dose in mRad:					23.1

WIPP 4 WIPP South Fence Center

Electret ID	Start Date and Time	Finish Date and Time	# of Days:	Voltage Drop	Quarterly Dose Normalized
SFK 487	1/4/12 1:15 PM	3/28/12 6:52 PM	84.23	46	27.3
SFK 527	1/4/12 1:15 PM	3/28/12 6:52 PM	84.23	43	25.4
SFK 569	1/4/12 1:15 PM	3/28/12 6:52 PM	84.23	42	24.9
Average Quarterly Dose in mRad:					25.9

WIPP 5 WIPP Near SE Corner of Fence

Electret ID	Start Date and Time	Finish Date and Time	# of Days:	Voltage Drop	Quarterly Dose Normalized
SFC 061	1/5/12 6:16 AM	3/29/12 6:09 AM	84.00	40	26.6
SFC 087	1/5/12 6:16 AM	3/29/12 6:09 AM	84.00	39	23.9
SFC 159	1/5/12 6:16 AM	3/29/12 6:09 AM	84.00	40	24.6
Average Quarterly Dose in mRad:					25.0

Table 1: Direct Penetrating Radiation Quarterly Dose Rates for CY 2012 Q-1

WIPP 6 WIPP Far SE Corner of Fence					
Electret ID	Start Date and Time	Finish Date and Time	# of Days:	Voltage Drop	Quarterly Dose Normalized
SFC 099	1/5/12 6:23 AM	3/30/12 6:25 AM	85.00	31	20.2
SFC 126	1/5/12 6:23 AM	3/30/12 6:25 AM	85.00	33	21.4
SFC 173	1/5/12 6:23 AM	3/30/12 6:25 AM	85.00	34	22.2
Average Quarterly Dose in mRad:					21.3
WIPP 7 WIPP East Fence Mid					
Electret ID	Start Date and Time	Finish Date and Time	# of Days:	Voltage Drop	Quarterly Dose Normalized
SFB 985	1/5/12 6:29 AM	3/29/12 12:22 PM	84.25	33	20.7
SFB 987	1/5/12 6:29 AM	3/29/12 12:22 PM	84.25	32	20.8
SFC 210	1/5/12 6:29 AM	3/29/12 12:22 PM	84.25	31	19.0
Average Quarterly Dose in mRad:					20.1
WIPP 8 WIPP NE Corner of Fence					
Electret ID	Start Date and Time	Finish Date and Time	# of Days:	Voltage Drop	Quarterly Dose Normalized
SFK 431	1/6/12 6:03 AM	3/29/12 12:30 PM	83.27	38	22.6
SFK 510	1/6/12 6:03 AM	3/29/12 12:30 PM	83.27	40	23.8
SFK 533	1/6/12 6:03 AM	3/29/12 12:30 PM	83.27	36	21.3
Average Quarterly Dose in mRad:					22.6
WIPP 9 WIPP North Fence NE					
Electret ID	Start Date and Time	Finish Date and Time	# of Days:	Voltage Drop	Quarterly Dose Normalized
SFB 961	1/6/12 6:10 AM	3/29/12 12:34 PM	83.27	36	23.5
SFB 995	1/6/12 6:10 AM	3/29/12 12:34 PM	83.27	33	21.5
SFC 018	1/6/12 6:10 AM	3/29/12 12:34 PM	83.27	34	22.1
Average Quarterly Dose in mRad:					22.4
WIPP 10 WIPP North Fence Salt Pile					
Electret ID	Start Date and Time	Finish Date and Time	# of Days:	Voltage Drop	Quarterly Dose Normalized
SFK 428	Anomalously high voltage drop. SFK 428 not included in average dose calculation.				
SFK 437	1/6/12 6:16 AM	3/29/12 12:39 PM	83.27	36	21.4
SFK 438	1/6/12 6:16 AM	3/29/12 12:39 PM	83.27	32	19.0
Average Quarterly Dose in mRad:					20.2

Table 1: Direct Penetrating Radiation Quarterly Dose Rates for CY 2012 Q-1**WIPP 11 WIPP NW Corner of Fence**

Electret ID	Start Date and Time	Finish Date and Time	# of Days:	Voltage Drop	Quarterly Dose Normalized
SFC 002	1/4/12 1:06 PM	3/29/12 6:02 AM	84.71	39	24.2
SFC 022	1/4/12 1:06 PM	3/29/12 6:02 AM	84.71	37	22.9
SFC 054	1/4/12 1:06 PM	3/29/12 6:02 AM	84.71	39	24.1
Average Quarterly Dose in mRad:					23.7

WIPP 12 WIPP Loading Dock WHB (West)

Electret ID	Start Date and Time	Finish Date and Time	# of Days:	Voltage Drop	Quarterly Dose Normalized
SFK 344	1/5/12 1:03 PM	3/28/12 6:37 PM	83.23	27	15.9
SFK 441	1/5/12 1:03 PM	3/28/12 6:37 PM	83.23	30	17.7
SFK 580	1/5/12 1:03 PM	3/28/12 6:37 PM	83.23	37	22.0
Average Quarterly Dose in mRad:					18.5

WIPP 13 WIPP Loading Dock WHB (Center)

Electret ID	Start Date and Time	Finish Date and Time	# of Days:	Voltage Drop	Quarterly Dose Normalized
SFC 039	1/5/12 12:42 PM	3/29/12 5:54 AM	83.72	38	23.9
SFC 053	1/5/12 12:42 PM	3/29/12 5:54 AM	83.72	35	21.7
SFC 062	1/5/12 12:42 PM	3/29/12 5:54 AM	83.72	36	22.5
Average Quarterly Dose in mRad:					22.7

WIPP 14 WIPP Loading Dock WHB (East)

Electret ID	Start Date and Time	Finish Date and Time	# of Days:	Voltage Drop	Quarterly Dose Normalized
SFK 473	1/5/12 12:50 PM	3/29/12 12:43 PM	84.00	40	23.5
SFK 574	1/5/12 12:50 PM	3/29/12 12:43 PM	84.00	36	21.2
SFK 578	1/5/12 12:50 PM	3/29/12 12:43 PM	84.00	41	24.2
Average Quarterly Dose in mRad:					23.0

WIPP 15 Carlsbad Bureau Office (Canal St)

Electret ID	Start Date and Time	Finish Date and Time	# of Days:	Voltage Drop	Quarterly Dose Normalized
SFC 063	1/5/12 1:09 PM	3/28/12 11:54 AM	82.95	42	27.3
SFC 114	1/5/12 1:09 PM	3/28/12 11:54 AM	82.95	41	26.1
SFC 145	1/5/12 1:09 PM	3/28/12 11:54 AM	82.95	39	24.8
Average Quarterly Dose in mRad:					26.1

Table 1: Direct Penetrating Radiation Quarterly Dose Rates for CY 2012 Q-1**WIPP 16 Loving Weigh Station**

Electret ID	Start Date and Time	Finish Date and Time	# of Days:	Voltage Drop	Quarterly Dose Normalized
SFC 075	1/5/12 12:39 PM	3/29/12 12:49 PM	84.01	51	31.2
SFC 195	1/5/12 12:39 PM	3/29/12 12:49 PM	84.01	47	27.9
SFC 212	1/5/12 12:39 PM	3/29/12 12:49 PM	84.01	43	25.7
Average Quarterly Dose in mRad:					28.3

WIPP 17 Malaga VFD

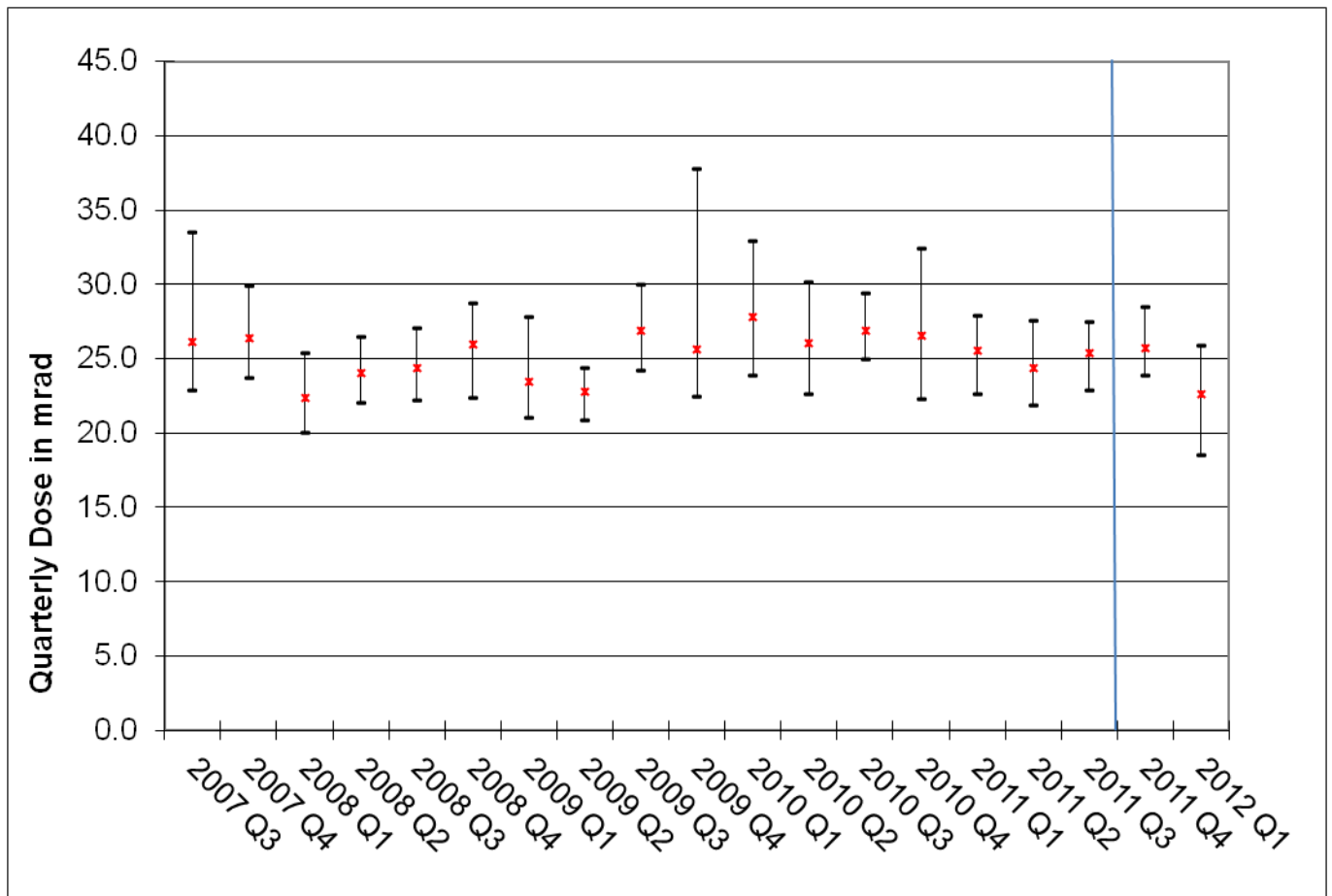
Electret ID	Start Date and Time	Finish Date and Time	# of Days:	Voltage Drop	Quarterly Dose Normalized
SFC 012	1/5/12 12:34 PM	3/29/12 12:24 PM	83.99	40	25.9
SFC 021	1/5/12 12:34 PM	3/29/12 12:24 PM	83.99	38	24.1
SFC 044	1/5/12 12:34 PM	3/29/12 12:24 PM	83.99	42	26.9
Average Quarterly Dose in mRad:					25.6

WIPP 18 Hobbs Hwy/ North Access Rd

Electret ID	Start Date and Time	Finish Date and Time	# of Days:	Voltage Drop	Quarterly Dose Normalized
SFC 092	1/5/12 6:33 AM	3/28/12 6:44 PM	83.51	38	24.0
SFC 182	1/5/12 6:33 AM	3/28/12 6:44 PM	83.51	33	20.6
SFC 183	1/5/12 6:33 AM	3/28/12 6:44 PM	83.51	37	23.5
Average Quarterly Dose in mRad:					22.7

WIPP 19 Southeast Control

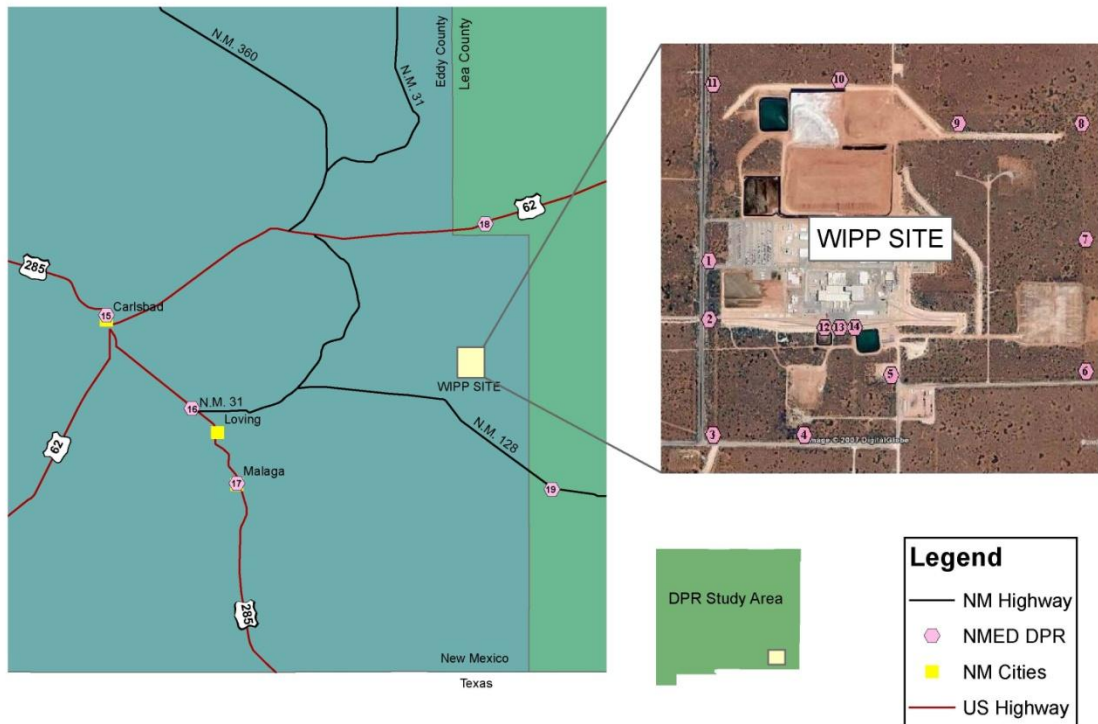
Electret ID	Start Date and Time	Finish Date and Time	# of Days:	Voltage Drop	Quarterly Dose Normalized
SFK 410	1/5/12 6:38 AM	3/29/12 12:12 PM	84.23	36	21.4
SFK 443	1/5/12 6:38 AM	3/29/12 12:12 PM	84.23	38	22.6
SFK 562	1/5/12 6:38 AM	3/29/12 12:12 PM	84.23	33	19.4
Average Quarterly Dose in mRad:					21.1



Graph 1: Average Quarterly Dose in the WIPP Exclusive Use Area by Quarter showing minimum and maximum values

The blue line denotes the implementation of 2012 program changes outlined in the previous report “Direct Penetrating Radiation Monitoring at the Waste isolation Pilot Plant Conducted by NMED/DOE OB for the CY 2011 Q-4.”

WIPP DOE OB Direct Penetrating Radiation



Map 1: Location of DPR Monitors Maintained by the Bureau